The Relative Importance of Price and Quality in Consumer Choice of Provider: The Case of Egypt

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September 1999

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Introduction

Competition has been the buzzword for reducing cost inflation and improving quality of health care services in the past two decades. Developed countries, such as the US, the UK, Singapore, Sweden, and less developed countries, such as some republics of the former Soviet Union, Colombia, Chile (others?), have all embraced in their recent health sector reforms the concept of promoting competition. More specifically, with the growing participation of the private sector in both financing and provision of health care services, many countries are contemplating the adoption of policies to encourage competition between public and private providers to improve the performance of the health sector. The recent movement towards greater hospital autonomy in many developing countries is evidence of this trend of preparing the public sector for competition with private sector providers (cite?). Proponents of public/private competition argue that competition will motivate public providers to increase efficiency and act as a benchmark for measuring and constraining any misconduct of the private sector (Hammer and Berman 1995?).

Whether competition can lead to efficiency gains and cost containment is subject to debate. Broadly speaking, competition can take two forms -- price and quality. While price competition is predicted to lower health care costs, whether the cost reduction will be gained at the expense of quality reduction depends on how responsive consumers are to quality, or how capable consumers are of evaluating quality. On the other hand, quality competition is predicted to increase health care costs, usually through product differentiation in the types of services, or different quality attributes for the same type of services. Often quality competition reduces the price elasticity of demand. Whether quality competition leads to welfare gains or losses depends on the relative magnitudes of quality improvement and cost increase. This, in turn, depends on consumers' relative responsiveness to price and quality. Using the Egypt Household Health Care Utilization and Expenditure Survey (EHHUES) of 1995, the primary objective of this paper is to test empirically for the relative magnitude of price and quality elasticities of demand to shed light on the extent to which price and quality competition takes place, and hence the likely outcomes for cost and quality. The results will also provide useful information for policy makers regarding the potential effects of increased public and private competition, allowing a more informed formulation of regulations or policies to accompany the implementation of competition.

The second objective of the paper is to document empirically whether there are differences in patients' perceptions of quality for different provider types, to the extent that perception of quality is measurable. In many developing countries where an established public sector offers "almost" free care, it is common to observe a relatively high proportion of the population using the private sector and paying prices several times higher than those of the public sector. The usual rationale is quality differences between the two sectors. However, to date there is little empirical evidence to support or refute this hypothesis, and if differences do exist, which aspects differ most. Taking advantage of the EHHUES, which contains relatively rich information on individuals' provider preferences and patients' evaluations of various aspects of quality of the different provider types in Egypt, we try to fill this gap in the literature.

Third, beyond the above general objectives applicable to most developing countries, the results of this study will contribute to the design of effective health policy in Egypt. Egypt is currently in the process of redesigning its health care sector, focusing on improving the efficiency and revenue generating capacity of the public sector. Our study will shed light on the extent to which the Ministry of Health (MOH) in Egypt can alter prices and quality to achieve these goals. Furthermore, given that it is Egypt's national goal to assure access to all its citizens, we will examine whether price increases in the public sector will adversely affect the lower income population of the country.

Conceptual Model and Hypothesis

We assume that the health care sector consists of two types of providers, public and private. Each maximizes its objective function subject to two constraints -- market demand for its services, and supply of inputs. We further assume that demand for services provided by the public sector is a function of prices and quality of both the public and private sectors, and similarly, demand for private sector services is a function of the prices and quality of both sectors. Demand is increasing in quality but decreasing in prices. On the other hand, both sectors face the same input supply constraint. Providers choose price and quality in order to maximize their objective functions. We do not, however, postulate whether the chosen prices and qualities are optimal in the sense of social welfare maximization.

Under these assumptions, providers are predicted to engage in price competition, leading to lower prices of services if demand is relatively more price than quality elastic. If the absolute elasticity of quality is also high, then price reductions will most likely be achieved through improved efficiency, leaving the level of quality unchanged or even improved. However, if demand is relatively quality inelastic, price competition may lead to lower quality. On the other hand, if demand is relatively more quality than price elastic, providers will engage in quality competition, leading to higher quality of services at higher or unchanged prices, depending on whether demand is elastic with respect to price.

When providers are predicted to compete on prices, an appropriate policy response would include proper regulation and monitoring of quality of services so that cost reductions will not be gained at the expense of quality. To the extent that consumers are quality insensitive, the government may also need to provide better quality information and educate consumers to ensure adequate quality of care. If providers are likely to engage in quality competition, it will be essential to understand which aspects of quality consumers are most sensitive to, since these will probably be the attributes on which providers will compete. If consumers are responsive to the aspects of quality that enhance health outcomes, the government may rely more on forces market to assure the quality of services. On the other hand, if consumers are more responsive to quality aspects that are expensive to increase yet have no discernible effect on health outcomes, then government regulation may again be required. For example, it has been observed in many countries that consumers view drug prescriptions and high technology procedures as indications of quality. Competition leading to increased use of these services will lead to cost inflation without necessarily providing additional health benefits to patients.

The theoretical predictions are summarized below in Figure 1.

	$\lvert\eta_p\rvert>1$			$\lvert\eta_p\rvert<1$		
	$1<\lvert\eta_{QL}\rvert<\lvert\eta_p\rvert$	$1<\lvert\eta_p\rvert<\lvert\eta_{QL}\rvert$	$\lvert\eta_{QL}\rvert<1<\lvert\eta_p\rvert$	$\lvert\eta_p\rvert<1<\lvert\eta_{QL}\rvert$	$\lvert\eta_p\rvert<\lvert\eta_{QL}\rvert<1$	$\lvert\eta_{QL}\rvert<\lvert\eta_p\rvert<1$
Price	↓	/=	↓	↑	↑	↓
Quality	=	↑	↓	↑	↑	↓
Cost inflation	low	high	low	high	high	low
Welfare			?	?	?	?

To measure consumer quality responsiveness, it is necessary to develop measures of health care quality, a multidimensional construct which does not have a single generally accepted definition. There are at least three components of health care quality: the technical aspects of quality, the interpersonal aspects of quality, and the amenities of care (Donabedian 1980). The technical aspect of quality refers to how well medical science and knowledge are applied to the diagnosis and treatment of the medical problem. The interpersonal aspect of quality refers to the interaction between the patient and the provider or the responsiveness, friendliness, and attentiveness of the health care provider. The amenities of care include the appeal and comfort of the health care facility. Furthermore, quality of care can be measured according to three categories: structure, process, and outcome. Structure refers to the relatively fixed characteristics of the medical delivery system such as the number, types, and qualifications of health care providers and facilities. Process measures reflect what is done to and for the patient — the application of medical procedures, drugs, etc. Outcome refers to the changes in the patients' current and future health status that can be attributed to antecedent medical care.

Given these different dimensions of quality, the welfare implications of price and quality competition are difficult to predict. Quality dimensions that increase demand may not be welfare enhancing if these dimensions are not directly related to improved health outcomes. Consumers are thought to have difficulty assessing the technical quality of the care they receive, and to focus instead on the interpersonal components of quality, including amenities such as location and waiting time (Donabedian, 1980). Consumer choice is based on perceived, rather than actual, quality differences. It is possible that providers will respond to price competition by reducing the technical component of quality and increasing the interpersonal component.

In this study, we focus on the patient's perception of quality. Evaluation of the quality of care from the patient's perspective is sometimes called "perceived quality" (Bitran and Block 1992) or "patient/consumer satisfaction". Although a patient's perception of quality may not be related to health outcome improvement, one may argue that an individual's satisfaction is utility increasing and therefore should be valued. Furthermore, for the purpose of this study, the quality aspects that we are trying to capture are those that patients care about or are able to evaluate. As Davies and Ware (1988, p. 44) note, "whatever quality means to consumers, their perceptions of quality affect their choices among health care alternatives". Ginsberg and Hammons (1988) hypothesized that health care consumers with limited information may be better able to evaluate the interpersonal aspects of quality than the technical aspects of quality, based on their own experiences and their friends' and relatives' experience. Research suggests that satisfaction is related to the perceived interpersonal and communication skills of the physician. Previous research also suggests there is a positive association between prices on the one hand and quality measured as time spent with the patient (Kowka 1984) and thoroughness of the examination (Haas-Wilson 1986) on the other. However, there have been few studies of whether patient satisfaction is related to technical quality or whether patients are capable of evaluating the technical aspects of quality.

Predicting the effects of public/private competition depends not only on consumer price and quality responsiveness but also on what the objectives of public sector providers are. While profit maximization is a commonly accepted objective for the private sector, there is no single commonly accepted objective function for the public sector. Public providers under a policy promoting direct competition with the private sector may adopt increasing market share as an objective. A public sector provider may seek to maximize output (Newhouse 1979). Alternatively, a public provider may adopt the objective of serving as a safety net for the poor. Regardless of which objective function is pursued, public providers face a demand constraint which is a function of the prices and qualities of the different providers in the market for health services. If the public sector has an objective function that differs significantly from that assumed in the model developed above, then what we observe may not be directly interpreted as the form of competition that has taken place but may nevertheless indicate what form of competition would be likely to result if public/private competition were promoted.

Previous Literature

There is a considerable body of empirical literature that examines patient choice of provider in developing countries. Most studies are in the context of user fee policy; that is, price elasticities of demand are estimated for public facilities to ascertain the potential capacity to increase revenue as user fees for public facilities are increased. The majority of the studies focus on price elasticities, with some controlling for quality differences among facility types. A few explicitly examine the effects of both price and quality on demand (Mwabu et al. 1993; Akin et al. 1994). These studies have used drug availability, number and/or type of medical personnel available, physical condition, and per capita facility expenditure as measures of quality. These measures are typically derived from facility/provider surveys, and they serve to answer the policy question of how much of a quality improvement in public facilities would be necessary in order to increase or maintain the same level of demand as user fees are raised. As such, they tend to focus on measures that are easily observable and can be changed by policy. However, these measures do not necessarily reflect patients' perceptions of quality, which we hypothesize to be more important in determining demand and choice of provider.

Ellis et al. (1994) estimated patient's choice of provider using data from a household survey in Cairo, Egypt. Respondents were asked to recommend providers for particular types of illness, and to describe the reasons for their recommendation. The number of times a quality related reason was given was used to construct a quality measure. This was then averaged across geographic areas for particular provider types. The authors did not find quality to be a significant determinant of a patient's choice of provider (and in the case of inpatient use, the coefficient had the wrong sign). However, they found that the estimated effect of price on choice was negative and significant, as theoretically predicted.

Another group of studies does not explicitly measure or control for quality but rather assumes that quality differences are embodied in provider type. For example, Dor and van der Gagg (1993) estimated choice over three possible outcomes (self care, care by a nurse, and care by a doctor), presuming that quality is highest for care from a doctor. Similarly, Lavy and Quigley (1993) assumed that quality is synonymous with provider type and estimated their choice model over six different options. Yet another approach (Gertler, Locay and Sanderson 1987; Gertler and van der Gagg 1990) subsumes quality in the characteristics of provider and patients. This method does not allow direct tests of consumer price and quality responsiveness, or willingness to pay for quality.

Background

In 1996, Egypt had a total population of 58 million, 5% of which lived in the 5% of the country located alongside the Nile river and its delta, and over 20% is concentrated in the four Urban Governorates of Cairo, Alexandria, Port Said, and Suez.[1] Egypt has a pluralistic health care system, with government and public sector agencies[2], as well as non-profit and for-profit private sector institutions, and individual private practitioners involved in the provision and financing of health care services.

Outpatient services are provided by a number of entities.

Ministry of Health (MOH): The MOH provides outpatient services directly through its hospitals and health units in both urban and rural areas. Services provided by these facilities are heavily subsidized by the government and are essentially free to all Egyptian residents.

Public Sector: Following the custom in Egypt, the public sector includes:

> *The Health Insurance Organization (HIO)*: A governmental organization under the MOH, the HIO provides health insurance to employees in the formal sector, widows and pensioners. The HIO provides services to its beneficiaries by direct provision through its network of hospitals and clinics. Beneficiaries usually pay less than LE 1.00 in the form of copayments.
>
> *The Curative Care Organization (CCO)*: A not for profit autonomous organization under the authority of the MOH, the CCO provides services to employees through contracts with their employers, to individuals on a fee-for-service basis, and accident cases without charges.
>
> *The Teaching Hospitals and Institutes Organization:* Under the administration of the MOH, this organization runs a number of teaching hospitals and other specialized facilities.
>
> *University hospitals:* Autonomous facilities affiliated with individual universities, these hospitals are under the responsibility of the Ministry of Education.
>
> *Other ministries:* Other ministries of the government, such as Education and Defense, also provide outpatient services through their own facilities.

Private clinics: The predominant providers of outpatient services in Egypt are private practice providers. The National Provider Survey of Egypt, 1995, estimated that there were close to 42,000 individual private practices in Egypt (Egypt Provider Survey Report, 1997). These providers operate under fee-for-service and charge prices normally several times higher than those of the MOH and public facilities. Since there is very little private insurance in Egypt, most patients seeking care from private clinics pay the full cost of care.

In 1995, total expenditures on health in Egypt were estimated to be LE 7,516 million, or 3.7% of GNP. Government/Public sector spending constituted about 43% of the total expenditure on health, while private spending accounted for the remaining 57%. About 35% of national health spending went to hospital-based services and 65% to non-hospital services. Government and public financing

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[1] Administratively, Egypt is divided into twenty six governorates.

[2] The Government sector refers to direct activities of the government ministries; the public sector consists of parastatal companies and organizations in which the government ministries have dominant decision-making authority.

supported 78% of the hospital sector, while private financing (mostly through household out-of-pocket spending), paid for 75% of non-hospital sector services[3] (Eliya et al, 1997).

Table 1 shows the choice of provider for outpatient care for the sample we use in this analysis. The rates for using MOH facilities, public facilities, private clinics and mosque clinics are 0.19, 0.19, 0.55, and 0.6, respectively. The proportion of people choosing private clinics for outpatient care increases rather substantially as income increases, but even in the lowest income quintile only 37% of the individuals use MOH facilities. This seems to contradict the government's policy objective of providing access to basic primary and preventive services for everyone, especially those who cannot afford to pay for their medical expenses. Individuals covered by insurance predominantly choose public facilities due to their benefits coverage. However, we also note that among the insured, about 38% still choose to use private clinics. Whether this is a result of quality differences or unavailability of facilities in the area of residence cannot be discerned from the data.

[3] Services are not, however, broken down into inpatient and ambulatory care.

Table 1

Distribution of Outpatient Visits by Provider Type

	MOH	***Public***	***Private***	***Mosque***
	36.6%	15.6%	45.5%	2.2%
Income Quintile 2: (560 - 840)	24.1%	20.1%	51.2%	4.7%
Income Quintile 3: (804 - 113)	21.7%	18.1%	53.7%	6.5%
Income Quintile 4: (114-1704)	18.6%	22.1%	51.3%	7.9%
Income Quintile 5: (>1704)	9.4%	19.1%	63.5%	8.0%
Insurance	9.7%	46.5%	38.4%	5.4%
No Insurance	22.5%	9.7%	60.9%	6.9%
Male	21.3%	11.9%	59.3%	7.5%
Female	16.0%	30.2%	48.7%	5.1%
Age 35 ~ 55	22.49%	15.62%	54.59%	7.30%
Age 56 ~ 65	13.93%	17.65%	61.30%	7.12%
Age >65	14.29%	16.84%	62.24%	6.63%
Illiterate	25.42%	10.92%	57.60%	6.06%
Primary School	18.97%	18.80%	56.57%	5.66%
Secondary School	16.24%	27.47%	48.99%	7.31%
College	7.54%	27.25%	57.68%	7.54%
Region 1	14.67%	27.67%	42.43%	15.32%
Region 2	14.46%	19.45%	62.09%	3.99%
Region 3	22.85%	13.16%	63.16%	0.83%
Region 4	16.56%	20.31%	54.69%	8.44%
Region 5	26.69%	14.19%	57.63%	1.48%
Urban	15.02%	23.90%	50.27%	10.81%
Rural	24.37%	13.57%	60.97%	1.09%
Total	**19.10%**	**19.30%**	**55.10%**	**6.50%**

Empirical Model

$$Prob(Y_i = j) = \frac{\exp(\$ Z_{ij} + " X_i)}{\sum_{j=0}^{J} \exp(\$ Z_{ij} + " X_i)}$$

Our estimation method is the conditional logit model, which can be motivated by a random utility model. For the i^{th} individual faced with J choices, the utility of choice j can be expressed as:

$$U_{ij} = \beta' Z_{ij} + \alpha' X_i + \epsilon_{ij} \qquad (1)$$

where Z is a vector of choice-specific attributes, and X is a vector of individual-specific characteristics, that affect the individual's choice of provider.

An individual chooses among alternatives based on the utility derived from each alternative. Utility maximization implies that individual i chooses alternative j if $U_{ij} > U_{ik}$, for all k not equal to j. The statistical model is driven by the probability that choice j is made, which is:

$$\text{Prob } (U_{ij} > U_{ik}) \qquad \text{for all other } k \neq j \qquad (2)$$

Let Y_i be a random variable indicating the choice made. McFadden (1973) has shown that if (and only if) the J disturbances are independently and identically distributed with a Weibull distribution,

$$F(\epsilon_{ij}) = \exp(-\epsilon_{ij}) \qquad (3)$$

then

The parameters of this model can be estimated using maximum-likelihood methods. Terms that do not vary across alternatives, that is, X_i, fall out of the probability. However, estimation of the α's can be operationalized by interacting X_i with choice-specific dummy variables.

Data and Variables

The data for this study is from the Egypt Household Health Care Use and Expenditure Survey (EHHUES), conducted in the winter of 1994 and summer of 1995. The sample consists of 10,664 households and 53,824 individuals, of which 9,931 households and 50,824 individuals were successfully interviewed (93.13% and 94.72%, respectively). The sample was designed to provide estimates of all major variables at the national and regional level, and was based on the same sampling frame as the Egypt Demographic and Health Survey, 1992. The frame consisted of 546 segments (208 rural and 338 urban) covering 21 governorates. Out of this a self-weighted sample of 362 segments (191 urban and 171 rural) was selected for the survey. A complete listing of all households in the selected segments was made and a systematic sample of households was selected.

Our analysis excludes individuals below 17 years old for two reasons. First, children's health care seeking behavior is largely determined by their parents, and their perception of quality would probably be based on their parents' perceptions. More importantly, in June 1992, the People's Assembly of Egypt passed Law 99 providing health insurance coverage to all school age children (between 6 and 16) under the School Health Insurance Program (SHIP). SHIP provides a comprehensive set of curative and preventive care with minimum cost sharing (cite). Outpatient services are provided through a network of HIO clinics, school health department health units, and

contracted private providers. However, our data cannot identify private providers under contract with the SHIP. Since the choice of provider by this group of the population is largely dictated by insurance coverage, estimating the price and quality tradeoff for this group would not be meaningful, especially since we cannot identify the private providers under contract with HIO to provide services to SHIP beneficiaries.

Two types of questionnaires were used in data collection: household and individual. The household questionnaire collected socio-demographic information on all members of the household who are usual residents. The individual questionnaire collected information on the individual's perception of his/her own health, employment, utilization and expenditures of health services, and the individual's perception of quality of health care. Two week and one year recall periods were used for outpatient and inpatient care, respectively.

Price:
We have two sources of information for measuring the monetary prices that patients face for a doctor's consultation: the actual expenditures reported by individuals from the household survey, and the doctor's fee collected from the National Provider Survey of Egypt, 1995. Using the individual's actual expenditure as the price measure poses two problems. First, the individual expenditure experience reflects the choice of the provider and vice versa, and therefore is endogenous. Second, the conditional choice model requires price measures for all the choices that the individual faces.

To overcome these two problems, we propose two methods. First, we used sample means of individual expenditures of each probability sampling unit (PSU) to measure prices that individuals face in the area in which they live. While the PSU may not necessarily represent the relevant market area within which the individual seeks health care, there is no other information that would allow us to define the relevant market otherwise. Second, we used the doctor's fee reported in the Provider Survey. This measure would purge the endogeneity problem. However, our data showed that the monetary price for a doctor's consultation in Egypt was made up of two components, the doctor's fee and the drug fee. The household survey data indicate that the average doctor's fees for MOH facilities and private clinics were LE 1.04 and LE 6.70, respectively, while the average drug fees were LE 6.04 and 16.34, respectively. Using the doctor's fee will understate the actual "price" that patients face. We have therefore included the doctor's fee and drug fee separately in our empirical analysis to capture differences in patients' responses to these two fees. Since information on drug fees is not available from the Provider Survey, we use the area mean of household expenditures on drugs in the PSU in which the individual lives for the two methods for measuring doctor's fees.

Quality:
The household survey consists of two sets of questions on quality. The first set of questions ask the individual the reason for choosing a given provider. Responses include good treatment, good reputation, prior experience, specialized staff, and being referred. A dummy variable is created for each reason and its value assigned to one when that reason is cited by the individual for choosing a particular type of provider. We then use factor analysis to construct a score for these dummy variables. The second set of questions involves patients' assessments of the health care provider they used. These could be broadly classified into three aspects of quality: access, structure, and process (see appendix A for a description of the questions), and they correspond closely to the dimensions posited by Donabedian (1980). Again, we use factor analysis to create a summary score of each aspect of quality. The scores are then normalized to a value between 0 and 1.

Results of the factor analysis are presented in Appendix B. For score 1, the two factors which explain the majority of the variations are "good treatment" and "good reputation". For access, the three factors that explain most of the variations are the need to make an appointment, the time needed for an appointment, and whether the clinic hours are convenient. For process, the important factors are whether physicians spend enough time with patients, and whether explanations are given

on the side effects of treatment or diagnosis. For structure, the factor analysis results indicate that most of the variations are related to cleanliness of facilities.

Table 2 compares the scores of quality and prices for the different types of providers in Egypt. The results show that in general private clinics have the highest quality scores.

Table 2
Measures of Price and Quality

	MOH	***Public***	***Private***	***Mosque***
Quality				
Score 1	0.371 (0.108)	0.310 (0.118)	0.522 (0.100)	0.468 (0.144)
Access	0.950 (0.065)	0.926 (0.086)	0.940 (0.059)	0.949 (0.090)
Process	0.603 (0.158)	0.603 (0.163)	0.765 (0.081)	0.703 (0.163)
Structure	0.862 (0.148)	0.855 (0.136)	0.958 (0.046)	0.955 (0.067)
Price				
Doc's Fee (Provider Survey)	0.787 (0.574)	1.458 (0.961)	9.031 (4.924)	3.109 (1.655)
Doc's Fee (Household Survey)	1.041 (1.553)	0.283 (1.552)	6.698 (3.888)	3.010 (1.646)
Drug Fee (Household Survey)	6.044 (5.950)	2.198 (4.154)	16.341 (7.341)	11.961 (9.336)

The quality scores for MOH and public facilities are very similar to each other, as are those for the private and mosque clinics. We also note that patients are in general satisfied with the quality of care they receive, across the different types of providers (Appendix A). The literature on measuring perceived quality/patient satisfaction finds that global evaluations tend to produce very high satisfaction levels, and suggests that more meaningful responses can be elicited by distinguishing separate dimensions of a health service in the form of separate items. (Hanson p.4). In the sample, the measures of specific aspects of quality are also quite high across the board; in particular, the measured quality of access and structure are high, and there is limited variation of each score among individual responses. This will probably limit the power of the estimation results.

On the other hand, prices are considerably different among the different provider types. In particular, private clinic prices are several fold of those of other providers. This would imply that consumers' willingness to pay for quality must be very high, and raises an interesting question of whether consumers are paying for anything that contributes positively to their health outcomes. The fees reported in the

household survey probably understate the actual prices for public facilities, although they do reflect the out of pocket cost faced by the beneficiaries.

Table 3 describes the variables used in the analysis and their summary statistics by type of provider.

Table 3
Descriptive Statistics of Sample

	MOH	***Public***	***Private***	***Mosque***
Income	1311.033	1717.138	2120.022	1940.254
Income1 (%)	0.233	0.094	0.097	0.040
Income2 (%)	0.134	0.165	0.148	0.114
Income3 (%)	0.213	0.177	0.184	0.189
Income4 (%)	0.205	0.242	0.197	0.257
Income5 (%)	0.159	0.321	0.374	0.400
Insurance	0.132	0.627	0.182	0.217
Age	37.826	41.335	41.286	39.594
Gender	0.339	0.635	0.360	0.32
Illiteracy (%)	0.496	0.212	0.392	0.349
Primary (%)	0.221	0.217	0.230	0.194
Secondary (%)	0.233	0.390	0.244	0.309
College (%)	0.050	0.181	0.134	0.149
Urban (%)	0.436	0.688	0.508	0.926
Chronic (%)	0.374	0.427	0.436	0.440
Days off	3.274	2.212	3.856	2.879
Health Status: Excellent (%)	0.004	0.012	0.011	0.011
Fairly Good (%)	0.093	0.108	0.092	0.097
Good (%)	0.407	0.462	0.362	0.474
Not So Good (%)	0.318	0.269	0.315	0.309
Bad (%)	0.178	0.150	0.220	0.109

Results

Descriptive results: Before discussing the results of the conditional logit model, we present descriptive results for various questions in the EHHUES on patient's preference of provider type.

Patients' Preference of Provider Type:

The EHHUES asks every individual in the sample, irrespective of whether they have had any episode of illness in the two weeks prior to the interview, their preference of provider type for minor illness, minor surgery, major surgery, and delivery. For each, individuals are first asked where they would most likely go for care. They are then asked if they could go anywhere for care, whether they would still go to the provider type they usually visit, and if not, where they would choose to go. Table 4 shows the results for minor illness. Individuals who usually go to private clinics for minor illness are least likely, while individuals who usually go to MOH facilities are most likely, to choose another provider if they were given a choice. Only 16% of the "regular" private clinic users chooses to go to another provider if given a choice, and among these 16%, 48% would choose another private clinic and very few would choose to go to another provider type. A considerable percentage of them do not know who they would choose as an alternative[4]. However, 41% of the "regular" MOH users would choose to go to another provider if given a choice, and 30% of the 41% would like to go see a private clinic doctor. This pattern is consistent across all types of regular users; that is, if individuals were given the opportunity to choose any provider under no cost constraint, private clinics were the preferred provider.

Switching Behavior:

According the survey, approximately 9% of individuals had at least one visit in the two weeks prior to the interview, and about 5% of these users (N = 195) had two visits. We analyze the switching pattern of these users. The results (Table 5) show that there is a strong inertia to stay with the same type of provider, as MOH users may choose to use MOH facilities again primarily due to costs, and public users would stay with public providers as a result of their insurance benefit coverage (which only entitles them to go to public facilities). However, among those that switch provider type, private clinics are again the preferred choice.

[4] The question does not ask the individual to name the "type" of provider that they would go to if they could go anywhere. Rather, it asks the individual to give the name and address of the provider that they would go to if they were given a choice. Any individual who does not know a specific place or provider that they would visit will then be coded as "don't know". If the question had been asked differently to get the respondent to respond to choice of provider "type", there probably would have been a much lower percentage of individuals answering "don't know".

Table 4
Revealed Preferences for Provider Type (Minor Illness)

		MOH	*Public*	*Private*	*Mosque*	*Other*	*Do not know*
Where are you likely to go?		19.12%	13.64%	36.80%	4.36%	1.51%	24.57%
If you could go anywhere, would it be the same?	Yes	59.56%	76.19%	83.86%	75.06%	78.36%	
	No	40.44%	23.81%	16.14%	24.94%	21.64%	
Where would you go?	MOH	7.17%	3.18%	4.29%	5.52%	4.60%	
	Public	3.34%	5.31%	1.89%	4.48%	3.45%	
	Private	28.11%	20.76%	47.63%	24.48%	24.14%	
	Mosque	2.04%	4.38%	2.27%	7.93%	4.60%	
	Other	0.15%	0.46%	0.19%	0.69%	0.00%	
	Do not know	59.19%	65.28%	43.72%	56.9%	63.22%	

Table 5
Switching (N=195)

Second Visit

		MOH	*Public*	*Private*	*Mosque*	*Other*
First Visit	MOH (N=40)	35.00%	7.50%	42.50%	10.00%	5.00%
	Public (N=38)	5.20%	42.00%	44.70%	5.20%	2.60%
	Private (N=103)	11.70%	14.60%	65.00%	4.90%	3.90%
	Mosque (N=12)	8.30%	25.00%	33.30%	33.30%	0.00%
	Other (N=2)	0.00%	0.00%	50.00%	0.00%	50.00%

Reasons for Choice of Provider:

Furthermore, we analyze the reasons for provider choice (Table 6). For individuals with visits in the two weeks prior to the interview, we asked them which provider they went to and why. The most cited reasons for choosing MOH and mosque facilities were cost and distance. In contrast, good reputation

and distance were the most cited reasons for use of private providers. (A significant proportion of the private users also cite cost, good treatment, and specialized staff as reasons for choosing their providers). Since use of public facilities is tied to health insurance coverage provided by HIO or CCO through employment, it is not surprising users of public facilities most often cite "employer specified" as the reason for their provider choice. It is interesting to note that users of private clinics are the most likely (and mosque clinic users the second most likely) to cite the two reasons most closely related to quality--namely good treatment and good reputation of that provider.

Table 6
Why Did You Choose?

	MOH	***Public***	***Private***	***Mosque***
Distance is short	55.0%	10.1%	33.5%	57.1%
Cost is suitable	49.2%	15.6%	21.0%	50.3%
Good Treatment	6.8%	5.2%	23.4%	16.0%
Has good reputation	13.4%	7.7%	46.5%	38.9%
Specified by employer	3.5%	48.1%	2.0%	0.5%
A prior experience	6.6%	6.7%	13.4%	8.6%
Specialized staff	12.0%	8.7%	30.6%	19.4%
I was referred to	13.6%	10.2%	1.3%	0.6%

Conditional Logit Results:
We first constrain the price and quality coefficients to be the same across types of providers to provide base case results. These should represent the average price and quality effects. The results are presented in Table 7. Table 7a uses doctors' fees from the Provider Survey, while Tables 7b uses doctors' fees as computed from the household survey. Tables 8a and 8b are analogous to Tables 7a and 7b, except that we use three separate measures of quality — structure, access, and process--instead of score1 (which is used in tables 7a and 7b) for comparison.

Table 7a

Choice	*Coef.*	*Std. Err.*	*z*
dcfee2	-.2743522	.0966638	-2.838
drfee	-.0486382	.045806	-1.062
dcfee2i	.0335709	.0130824	2.566
drfeei	.006518	.0062289	1.046
fac200	.3574459	.3050317	1.172
public	-3.400043	.8118565	-4.188
lninc	.0911793	.1211731	0.752
insurance	1.642534	.2063122	7.961
gender	.6306683	.1778262	3.547
age	.0327574	.0066045	4.960
primary	.5003526	.2316499	2.160
secondary	.9298275	.2504149	3.713
college	.8148321	.3520102	2.315
chronic	.0177019	.1752094	0.101
daysoff	-.01837	.0211947	-0.867
urban	.532126	.1886658	2.820
private	-1.134155	.8905962	-1.273
lninc	.0990923	.1320533	0.750
insurance	.0465253	.1938854	0.240
gender	-.0166803	.1492844	-0.112
age	.0259225	.0053493	4.846
primary	.3907219	.1756551	2.224
secondary	.5816083	.1969359	2.953
college	1.151132	.2986991	3.854
chronic	-.0267133	.1435759	-0.186
daysoff	.0511999	.0162827	3.144
urban	.0525383	.1521823	0.345
mosque	-2.757652	1.014419	-2.718
lninc	.1428784	.1449104	0.986
insurance	.0407826	.2720849	0.150
gender	.1033702	.225701	0.458
age	.0133823	.008276	1.617
primary	-.2176779	.284742	-0.764
secondary	.2118609	.3011871	0.703
college	.4501434	.4027561	1.118
chronic	-.183907	.2168794	-0.848
daysoff	.0158598	.0255022	0.622
urban	1.163224	.3466597	3.356

Number of obs = 6284
chi2(38) = 771.92
Prob > chi2 = 0.0000
Pseudo R2 = 0.1743
Log Likelihood = -1828.894

Table 7b

Choice	*Coef.*	*Std. Err.*	*z*
dcfee	-.3881685	.0974133	-3.985
drfee	.0020356	.0431963	0.047
dcfeei	.0512396	.0129977	3.942
drfeei	-.0001736	.0059374	-0.029
fac200	.4632205	.2558584	1.810
public	-3.731558	.6814813	-5.484
lninc	.1566995	.1040778	1.506
insurance	1.703501	.1808623	9.419
gender	.6113305	.1525574	4.007
age	.0267359	.0055668	4.803
primary	.537337	.2004478	2.681
secondary	.9464993	.216278	4.376
college	1.001094	.3070438	3.260
chronic	.1454072	.1506386	0.965
urban	.5136373	.1533787	3.349
private	-1.698271	.6735123	-2.522
lninc	.2273744	.1007323	2.257
insurance	.0599652	1672628	0.359
gender	-.0765217	.1209278	-0.633
age	.019358	.004259	4.545
primary	.3332096	.1438313	2.317
secondary	.5900496	.1624116	3.63
college	1.081063	.2590971	4.172
chronic	.0444987	.1170292	0.380
daysoff	.0394212	.0127603	3.089
urban	-.1171167	.1168432	-1.002
mosque	-3.2482	.9587536	-3.388
lninc	.236935	.1382673	1.714
insurance	.0794753	.2576888	0.308
gender	.0539629	.2125393	0.254
age	.007483	.0076737	0.975
primary	-.2177754	.2678695	-0.813
secondary	.1676983	.2836352	0.591
college	.4220555	.3777454	1.117
chronic	-.1100027	.2038175	-0.540
daysoff	.005492	.0238832	0.230
urban	1.236528	.3284959	3.764

Number of obs = 8468
chi2(38) =1165.53
Prob > chi2 = 0.0000
Pseudo R2 = 0.1945
Log Likelihood = -2413.5012

Price Effect:
Our results show that both doctors' fees and drug fees reduce a patient's likelihood of choosing a given provider. In particular, coefficients for doctors' fees, whether using household or provider data, are statistically significant across all specifications, and are of much bigger magnitude than the coefficients for drug fees. The negative impact of doctors' fees is relatively smaller when we use doctors' fees from the Provider Survey (Tables 7a and 8a) rather than doctors' fees from the household survey (Tables 7b and 8b). Theoretically, since price measures from the provider survey are not based on the sample of providers used by the individuals, they therefore should not be subject to selectivity bias. The different price coefficient estimates resulted from the two different measures would imply that measuring price by area averages of reported household expenditure data (as done in many studies, such as Heller 1982, Mwabu 1986 and 1988, Schwartz et al 1993, Ellis et al 1994) may not be sufficient to purge the endogeneity inherent in the reported expenditure data. These results are robust no matter which quality measures we use.

Income Effect:
Our results also show a very significant income effect that moderates the negative impact of price on a patient's choice of provider. That is, individuals with higher income are less sensitive to prices. This result corroborates the Peru results of Gertler et al. (1987) and the Egypt results of Ellis et al. (1994). However, Akin et al. (1995) was not able to show any significant interactive effect between price and income. A significant interactive effect between price and income would imply (1) that user fees are regressive, as other researchers have concluded; but more importantly, (2) that health care costs tend to escalate as the income of a country grows, because individuals not only demand more services, but also become less sensitive to higher prices.

Quality Effect:
Quality on average has a positive effect on patient's choice of provider. These effects are not as precisely measured as the price coefficients, probably because there is limited variation in the quality measures (as shown in Table 2). It is interesting to note that patients are most responsive to the process dimension of quality attributes, such as whether the physician spends enough time with the patient, the attitude of the staff, etc. We have also tried adding interaction terms between quality and income, but did not find any significant results and subsequently omitted them from the analysis to reduce the potential problem of multi-collinearity.

Elasticities:
Coefficient estimates from a conditional logit model are difficult to interpret since they do not represent either elasticities or marginal effects. We calculate elasticities at the mean values for both quality measures; the results are presented in Tables 9a and 9b. The results in Table 9a are based on estimation results presented in Table 7a, while results in Table 9b are based on estimation results in Table 8a. Compared to other studies, the magnitude of the estimated price elasticities are relatively small, except for that for private doctors. The Rand Health Insurance experiment found that elasticities of demand for ambulatory care were between -0.16 and -0.2. The price elasticities estimated for drug fees are even smaller. Especially for patients in the higher income quintiles, drug price elasticities are minimal. Similarly, cross price elasticities are small compared to the already minimal own price elasticities, reflecting limited substitution of services between provider types. Quality elasticities are relatively larger than the price elasticities, except for private clinics. Based on the predictions of the conceptual model, these results suggest that providers in Egypt are engaged in quality rather than price competition, probably in the form of product differentiation (given the small magnitude of the cross price elasticities). To the extent that price elasticities are smaller than quality elasticities, quality improvements can be gained at the expense of higher cost. This is especially true when the country's income increases over time and patients get less and less responsive to price increases. What is comforting is that the price elasticities (own and cross) for

Table 8a

Choice	*Coef.*	*Std. Err.*	*z*
dcfee2	-.2917462	.0982298	-2.970
drfee	-.0465169	.0468326	-0.993
dcfee2i	.0358943	.0132765	2.704
drfeei	.0062893	.0063626	0.988
access	.2769097	.4364021	0.635
process	.4046218	.2702237	1.497
struct	-.1833538	.3524503	-0.5206
lninc	.1159939	.1220885	0.950
insurance	1.650539	.2067837	7.982
gender	.6374622	.1784854	3.572
age	.0327832	.0066365	4.940
primary	.4874606	.2330597	2.092
secondary	.9138082	.2513988	3.635
chronic	.0198434	.1760881	0.113
daysoff	-.0206358	.0212376	-0.972
urban	.5570129	.1898874	2.933
private	-1.117854	.8890679	-1.257
insurance	.0463869	.1942367	0.239
gender	-.0249274	.1496022	-0.167
age	.0262631	.0053647	4.896
primary	.3663865	.1760035	2.082
secondary	.5658783	.1973807	2.867
college	1.142846	.2994637	3.816
chronic	-.0100098	.1439383	-0.070
daysoff	.0493987	.0162811	3.034
urban	.0579277	.1523958	0.380
mosque	-2.87927	1.021009	-2.820
lninc	.1525306	.1456499	1.047
insurance	.0537615	.27242	0.197
gender	.1047003	.2261175	0.463
age	.0136383	.0082839	1.646
primary	-.2224088	.2851843	-0.780
secondary	.2070108	.3017286	0.686
college	.4513699	.4041413	1.117
chronic	-.1717022	.2171081	-0.791
daysoff	.0144778	.0255208	0.567
urban	1.228812	.3479331	3.532

Number of obs = 6250
chi2(40) = 772.65
Prob > chi2 = 0.0000
Pseudo R2 = 0.1753
Log Likelihood = -1817.3305

Table 8b

Choice	*Coef.*	*Std. Err.*	*z*
dcfee	-.4043531	.0977417	-4.137
drfee	.0029863	.0438545	0.068
dcfeei	.0532993	.0130272	4.091
drfeei	-.0002601	.0060283	-0.043
access	.3864356	.4022331	0.961
process	.5479403	.2315901	2.366
struct	-.0730703	.2832687	-0.258
public	-3.881133	.6949016	-5.585
lninc	.1792934	.1051901	1.704
insurance	1.700352	.1814778	9.369
gender	.6277764	.1532292	4.097
age	.0267392	.0056016	4.774
primary	.5038039	.2012888	2.503
secondary	.9305639	.2171775	4.285
college	.981975	.307531	3.193
chronic	.1494745	.151445	0.987
daysoff	-.0324615	.0181392	-1.790
urban	.5180019	.1545375	3.352
Private	-1.716801	.6794371	-2.527
lninc	.2287562	.101939	2.244
insurance	.0510449	.1676358	0.304
gender	-.0751152	.1212527	-0.619
age	.0198293	.0042773	4.636
primary	.3076254	.1440109	2.136
secondary	.5787058	.162791	3.555
college	1.073288	.259517	4.136
chronic	.0535898	.1174545	0.456
daysoff	.0378259	.0127891	2.958
urban	-.1170913	.1174753	-0.997
mosque	-3.407372	.9655054	-3.529
lninc	.2452389	.1390761	1.763
insurance	.0826926	.2582771	0.320
age	.0076525	.0076777	0.997
primary	-.2182404	.2680703	-0.814
secondary	.1690313	.2842202	0.595
college	.4265588	.3787778	1.126
chronic	-.1057998	.2039941	-0.519
daysoff	.0040879	.023939	0.171
urban	1.345797	.3289276	4.091

Number of obs = 8418
chi2(40) =1161.26
Prob > chi2 = 0.0000
Pseudo R2 = 0.1949
Log Likelihood = -2398.4271

Table 9a

	Quintile					
Average	***1***	***2***	***3***	***4***	***5***	***6***
Own-price elasticities						
Doc's fees						
moh	-0.0219	-0.0458	-0.0390	-0.0347	-0.0250	-0.0031
public	-0.0331	-0.0744	-0.0577	-0.0530	-0.0388	-0.0034
private	-0.1756	-0.4885	-0.3232	-0.2380	-0.1865	-0.0318
mos	-0.0745	-0.1646	-0.1361	-0.1169	-0.0805	-0.0121
Drug fees						
moh	-0.0062	-0.0435	-0.0331	-0.0220	-0.0072	0.0182
public	-0.0004	-0.0113	-0.0069	-0.0042	-0.0019	0.0067
private	-0.0135	-0.0885	-0.0590	-0.0363	-0.0127	0.0259
mos	-0.0063	-0.0689	-0.0550	-0.0360	-0.0158	0.0432
Cross-price elasticities wrt:						
Doc's fees						
moh	0.0056	0.0160	0.0103	0.0086	0.0051	0.0010
public	0.0108	0.0247	0.0200	0.0163	0.0116	0.0020
private	0.0964	0.2087	0.1693	0.1463	0.1267	0.0047
mos	0.0120	0.0272	0.0211	0.0183	0.0134	0.0021
Drug fees						
moh	0.0027	0.0141	0.0092	0.0059	0.0016	-0.0023
public	0.0003	0.0029	0.0018	0.0012	0.0006	-0.0014
private	0.0027	0.0480	0.0377	0.0256	0.0096	-0.0337
mos	0.0013	0.0129	0.0087	0.0059	0.0028	-0.0066
Elasticities wrt Quality Measure I						
Own elasticity						
moh	0.1052					
public	0.0825					
private	0.1007					
mos	0.1448					
Cross elasticity wrt quality measure I						
moh	-0.0221					
public	-0.0273					
private	-0.0808					
mos	-0.0233					

Table 9b

	Quintile					
Average	***1***	***2***	***3***	***4***	***5***	***6***
Own-price elasticities						
Doc's fees						
moh	-0.0219	-0.0465	-0.0402	-0.0356	-0.0253	-0.0019
public	-0.0337	-0.0821	-0.0604	-0.0550	-0.0395	-0.0015
private	-0.1763	-0.4847	-0.3379	-0.2448	-0.1884	-0.0257
mos	-0.0755	-0.1747	-0.1422	-0.1210	-0.0818	-0.0084
Drug fees						
moh	-0.0036	-0.0371	-0.0293	-0.0187	-0.0047	0.0195
public	-0.0001	-0.0108	-0.0062	-0.0036	-0.0013	0.0070
private	-0.0095	-0.0821	-0.0535	-0.0313	-0.0087	0.0284
mos	-0.0018	-0.0635	-0.0494	-0.0309	-0.0109	0.0462
Cross-price elasticities wrt:						
Doc's fees						
moh	0.0063	0.0184	0.0138	0.0092	0.0054	0.0009
public	0.0009	0.0014	0.0029	0.0010	0.0011	0.0000
private	0.0640	0.1638	0.1260	0.1038	0.0827	-0.0079
mos	0.0121	0.0289	0.0218	0.0189	0.0136	0.0015
Drug fees						
moh	0.0022	0.0132	0.0084	0.0051	0.0010	-0.0025
public	0.0001	0.0025	0.0016	0.0010	0.0004	-0.0015
private	-.00030	0.0455	0.0334	0.0220	0.0064	-0.0358
mos	0.0006	0.0121	0.0078	0.0051	0.0019	-0.0071
Own Elasticities wrt Quality Measure II						
Access						
moh	0.2165					
public	0.1924					
private	0.1450					
mos	0. 2270					
Process						
moh	-0.0221					
public	-0.0273					
private	-0.0808					
Structure						
moh	-0.1313					
public	-0.1178					

private doctors are relatively larger than for other sectors, indicating that if private clinics are made to compete directly with MOH or public facilities, there will be a constraining effect on price increases of private clinics. In other words, the MOH sector can be used as a benchmark in order to constraint extreme growth of health care cost in the private sector.

Table 9b (Cont.)

	Quintile					
Average	***1***	***2***	***3***	***4***	***5***	***6***
private	-0.0980					
mos	-0.1512					
Cross Elasticities wrt Quality Measure II						
Access						
moh	-0.0456					
public	-0.0642					
private	-0.1149					
mos	-0.0355					
Process						
moh	-0.0439					
public	-0.0615					
private	-0.1340					
mos	-0.0380					
Structure						
moh	0.0278					
public	0.0393					
private	0.0776					
mos	0.0235					

Other Covariates:
Results of other covariates are consistent with expectation. Men and insured individuals are more likely to use public facilities. Individuals with higher education levels, independent of their income, are more likely to use private and public facilities. This is probably because we have included teaching hospitals, which attract more educated people, in the public classification. Individuals living in urban areas are more likely to go to public and mosque clinics, because these facilities are located in the urban areas. It is interesting to note that individuals who took more days off from work are much more likely to go to a private provider. Our data, however, do not allow us to differentiate whether this is a severity of illness effect, or whether it is easier to obtain sick leave letters from private providers.

We then allow the coefficients to vary across provider choice, and test for whether the coefficients are significantly different across provider choice. We found that the coefficients for both price and quality (not reported here) do not vary across provider type significantly. The Chi-2 statistics is 2.89 (prob > chi2 = 0.4083). Therefore we base the simulation results on the model where the coefficients are fixed across provider types.

Simulation Results:
Using the estimated results, we simulated individuals' choices of provider as MOH and private prices and quality vary, assuming the current level of public and mosque prices and qualities. The results are presented in Table 10. We notice that even when quality measures for MOH facilities are set to the maximum value observed in the sample, the probability of choosing MOH only increases from 17.9% to 18.9%. When we examine the impacts by income quintiles, the differences in response are very pronounced.

Table 10
Simulation Results:
Predicted Probabilities of Choosing Given Provider Types

	MOH	***Public***	***Private***	***Mosque***
Sample	17.14%	24.97%	44.25%	13.64%
MOH Price and Quality Equals Private Price and Quality	14.40%	25.73%	45.58%	14.30%
Income Quintile 1	16.89%	28.41%	38.56%	16.14%
Income Quintile 2	17.17%	25.98%	42.31%	14.53%
Income Quintile 3	16.54%	25.67%	43.26%	14.54%
Income Quintile 4	14.14%	26.21%	44.50%	15.15%
Income Quintile 5	12.11%	24.83%	49.86%	13.13%
Private Price and Quality Equals MOH Price and Quality	15.52%	23.42%	48.54%	12.53%
Income Quintile 1	20.30%	21.54%	47.21%	10.95%
Income Quintile 2	19.41%	21.29%	48.20%	11.11%
Income Quintile 3	18.19%	22.29%	47.66%	11.86%
Income Quintile 4	15.32%	23.48%	48.21%	13.00%
Income Quintile 5	12.16%	25.01%	49.56%	13.28%

	MOH	*Public*	*Private*	*Mosque*
MOH Quality Equals Private Quality	17.88%	24.79%	43.83%	13.50%
Income Quintile 1	26.22%	25.63%	34.35%	13.81%
Income Quintile 2	23.62%	24.18%	39.14%	13.06%
Income Quintile 3	21.53%	24.39%	40.64%	13.44%
Income Quintile 4	17.74%	25.30%	42.60%	14.36%
Income Quintile 5	12.74%	24.70%	49.57%	13.00%
MOH Quality Equals Maximum Value	18.85%	24.55%	43.29%	13.32%
Income Quintile 1	27.51%	25.25%	33.72%	13.51%
Income Quintile 2	24.75%	23.89%	38.51%	12.85%
Income Quintile 3	22.63%	24.11%	40.03%	13.22%
Income Quintile 4	18.71%	25.06%	42.07%	14.16%
Income Quintile 5	13.53%	24.51%	49.09%	12.86%

		MOH	*Public*	*Private*	*Mosque*
Varying Private Quality: 0th		18.52%	26.55%	40.21%	14.73%
	20th	17.98%	25.93%	41.78%	14.30%
	40th	17.44%	25.31%	43.38%	13.87%
	60th	16.90%	24.68%	44.98%	13.44%
	80th	16.36%	24.03%	46.60%	13.01%
	100th	15.81%	23.39%	48.22%	12.58%
Varying Private Price: 0th		15.39%	23.18%	49.08%	12.35%
	20th	16.04%	23.81%	47.39%	12.76%
	40th	16.50%	24.26%	46.19%	13.05%
	60th	17.47%	25.17%	43.71%	13.66%
	80th	18.33%	25.96%	41.49%	14.21%
	100th	21.97%	29.19%	32.30%	16.54%
Varying MOH Quality: 0th		15.49%	25.37%	45.19%	13.95%
	20th	16.40%	25.15%	44.68%	13.78%
	40th	17.34%	24.92%	44.14%	13.60%
	60th	18.33%	24.68%	43.58%	13.41%
	80th	19.36%	24.42%	43.00%	13.22%
	100th	20.43%	24.16%	42.40%	13.02%
Varying MOH Price: 0th		17.57%	24.86%	44.02%	13.55%
	20th	17.52%	24.87%	44.05%	13.56%
	40th	17.29%	24.93%	44.17%	13.60%
	60th	17.06%	24.98%	44.36%	13.64%
	80th	17.04%	24.99%	44.31%	13.65%
	100th	16.22%	25.20%	44.76%	13.82%

Two-choice case:

From a policy perspective, it is more likely that competition will be promoted between the MOH sector and private clinics, rather than between public facilities (or mosque clinics) and private clinics. We therefore estimated the same model, but only for MOH and private clinic providers. The results are in Tables 11a and 11b, and the corresponding elasticities are in Tables 12a and 12b. The coefficient estimates for key variables are relatively similar to those of the four choice model, and conclusions remain robust. However, the process variable becomes statistically significant, since there is much greater variation of this variable between MOH facilities and private clinics. These results also provide some evidence that the four choice model does not violate the Independence of Irrelevance Alternatives (IIA) assumption, which requires the odds ratios between any two options to remain the same when one or more of the other alternatives are made unavailable. Formally, this can be tested by comparing the coefficient estimates of the full model against the model with one or more alternatives removed. If the IIA assumption is satisfied, then coefficient estimates from the two models should be similar.

Table 11a
Conditional (fixed-effects) logistic regression

Choice	*Coef.*	*Std. Err.*	*z*	*P>|z|*	*[95% Conf.]*	*Interval*
dcfee	-.3313484	.1248547	-2.654	0.008	-.5760592	-.0866377
drfee	-.0760526	.0667855	-1.139	0.255	-.2069497	.0548445
dcfeei	.0442412	.0176715	2.504	0.012	.0096056	.0788768
drfeei	.0119459	.0094418	1.265	0.206	-.0065598	.0304515
fac200	.4449878	.3936556	1.130	0.258	-.3265631	1.216539
private	-.8433731	.8625865	-0.978	0.328	-2.534012	.8472654
lninc	.0802732	.1300881	0.617	0.537	-.1746948	.3352411
insurance	.0207959	.1732871	0.120	0.904	-.3188406	.3604323
gender	-.076518	.1222978	-0.626	0.532	-.3162173	.1631813
age	.019329	.0042769	4.519	0.000	.0109464	.0277117
primary	.3290696	.1458661	2.256	0.024	.0431773	.6149619
secondary	.6075813	.1673114	3.631	0.000	.2796569	.9355056
college	1.118595	.2677047	4.178	0.000	.593904	1.643287
chronic	.0498336	.1185924	0.420	0.674	-.1826033	.2822705
daysoff	.0401977	.0129468	3.105	0.002	.0148224	.065573
urban	-.080029	.1289271	-0.621	0.535	-.3327216	.1726635

Number of obs = 3496
chi2(16) = 444.69
Prob > chi2 = 0.0000
Log Likelihood = -989.2779
Pseudo R2 = 0.1835

Table 11b
Conditional (fixed-effects) logistic regression

Choice	*Coef.*	*Std. Err.*	*z*	*P>|z|*	*[95% Conf.*	*Interval]*
dcfee2	-.3866368	.1332252	-2.902	0.004	-.6477534	-.1255201
drfee	-.0462595	.0713067	-0.649	0.517	-.1860181	.0934991
dcfee2i	.0522536	.0188037	2.779	0.005	.015399	.0891083
drfeei	.0076623	.0100687	0.761	0.447	-.012072	.0273966
taccess	.2235564	.3308153	0.676	0.499	-.4248296	.8719424
tproces	.7392412	.371227	1.991	0.046	.0116497	1.466833
tstruct	.0017519	.3866522	0.005	0.996	-.7560724	.7595763
priv	-.9670657	.8714852	-1.110	0.267	-2.675145	.7410138
plninc	.0950947	.1315348	0.723	0.470	-.1627088	.3528982
pinsur	.0313378	.1744438	0.180	0.857	-.3105657	.3732413
pgender	-.0842493	.122785	-0.686	0.493	-.3249035	.1564049
page	.0194699	.004294	4.534	0.000	.0110539	.0278859
pprim	.3170779	.1461309	2.170	0.030	.0306665	.6034892
psec	.5679397	.1678211	3.384	0.001	.2390164	.8968631
pcollege	1.098908	.2679521	4.101	0.000	.5737314	1.624084
pchronic	.047145	.1191711	0.396	0.692	-.186426	.280716
pdaysoff	.037784	.0129721	2.913	0.004	.0123592	.0632088
purb	-.0980303	.1296508	-0.756	0.450	-.3521411	.1560806

Number of obs = 3480
chi2(18) = 447.50
Prob > chi2 = 0.0000
Log Likelihood = -982.32799
Pseudo R2 = 0.1855

Table 12a
Average Elasticities: 2-choice

	Quintile					
Average	***1***	***2***	***3***	***4***	***5***	***6***
Own-price elasticities						
Doc's fees						
public	-0.0095	-0.0370	-0.0239	-0.0157	-0.0084	0.0155
private	-0.0555	-0.1949	-0.1084	-0.0654	-0.0239	0.0258
Doc's fees						
public	0.0409	-0.0100	0.0074	0.0232	0.0472	0.0924
private	0.0292	-0.0244	0.0100	0.0298	0.0442	0.0548
Cross-price elasticities wrt:						
Doc's fees						
public	0.0064	0.0214	0.0128	0.0071	0.0031	-0.0026
private	0.0451	0.2334	0.1813	0.1289	0.0646	-0.1967
Drug fees						
public	-0.0123	0.0074	-0.0040	-0.0119	-0.0171	-0.0234
private	-0.1210	0.0310	-0.0175	-0.0633	-0.1278	-0.2891
Own Elasticities wrt Quality Measure I						
public	0.1252					
private	0.0716					
Cross Elasticities wrt Quality Measure I						
public	-0.0514					
private	-0.1762					

Table 12b
Average Elasticities: 2-choice

	Quintile					
Average	***1***	***2***	***3***	***4***	***5***	***6***
Own-price elasticities						
Doc's fees						
public	-0.0083	-0.0409	-0.0255	-0.0158	-0.0066	0.0211
private	-0.0556	-0.2121	-0.1187	-0.0663	-0.0183	0.0361
Doc's fees						
public	0.0365	-0.0014	0.0152	0.0247	0.0404	0.0709
private	0.0305	0.0004	0.0213	0.0322	0.0394	0.0426
Cross-price elasticities wrt:						
Doc's fees						
public	0.0064	0.0235	0.0139	0.0072	0.0025	-0.0038
private	0.0261	0.2524	0.1916	0.1292	0.0483	-0.2662
Drug fees						
public	-0.0124	-0.0008	-0.0086	-0.0130	-0.0148	-0.0179
private	-0.1070	-0.0020	-0.0363	-0.0682	-0.1127	-0.2212
Own Elasticities wrt Quality Measure II						
Process						
public	0.3111					
private	0.1626					
Structure						
public	0.0011					
private	0.0005					
Cross Elasticities wrt Quality Measure II						
Access						
public	-0.0588					
private	-0.1404					
Process						
public	-0.1307					
private	-0.4002					
Structure						
public	-0.0004					
private	-.0.0012					

Policy Conclusions

First, we found that patients are relatively more responsive to quality changes than price changes. In fact, our estimates of price elasticities are rather small compared to other studies. These results imply that providers of outpatient services in Egypt are competing more on quality--probably in the form of product differentiation--than on prices. As a consequence, it is likely that if the Egypt Government adopts a national health policy promoting competition between the Government and private sectors, providers are most likely to engage in quality rather than price competition. The Government would need to adopt appropriate regulations to monitor the type of quality competition that takes place so as to ensure that cost increases resulting from quality improvements are cost effective, and that the quality attributes that providers compete on lead to improvement in health status. Since other studies have found that patients are not capable of evaluating the technical aspects of quality, it would be advisable for the government in this case to increase information on quality of care to consumers.

Second, we also found evidence (though statistically insignificant given the data) that consumers are sensitive to quality aspects such as process and access. These aspects of quality are easy to manipulate and allow providers to easily quality discriminate. In particular, our results imply that in countries like Egypt, where providers usually have dual job holdings in both MOH facilities and private clinics, providers can easily discriminate or attract patients to the private sector by changing the work hours, spending more time explaining problems to patients, presenting a better attitude, etc., to gain more patients and at the same time charge higher prices. Although our study cannot prove conclusively whether or not there is a welfare loss as a result of dual job holding and quality discrimination, or whether physicians with multiple jobs actually quality discriminate, our results at least alert policymakers to the need to study and monitor more closely the quality of services provided as a result of multiple job holdings.

Third, the relatively large income effect implies that as income grows, cost inflation is likely to result. Other studies have documented that the income elasticity of health care expenditure is greater than one; that is, as income grows, a higher proportion of income will go to medical services (cite, Hammer). Our results show that income also significantly moderates the price effect, making consumers even less sensitive to price increases. These results highlight the fact that demand side cost sharing is not going to be effective as a cost control mechanism as a country's economy and income level grow.

Our study also has several limitations. First, the quality measures do not capture all the different aspects of quality. The fact that we find very little difference in patients' assessments of quality across provider type does not allow us to say confidently that there is little "actual" quality difference among providers. Because the quality measures that we use are mostly related to process, structure, and access, we also cannot make any inferences from our results regarding improvement of health status or health outcomes for consumers.

Second, to the extent that our quality measures are based on individuals' ex post valuation of quality, these measures may be subject to selectivity bias, hence biasing the results. That is, patients' valuations of the quality attributes of the providers that they chose to visit probably overstates quality relative to the perception of an average sample of patients. This selectivity bias can possibly explain the rather similar responses to quality questions across provider types, which reduces the variation in the measures of quality.

Finally, if the public sector has an objective function that differs significantly from that assumed in the conceptual model used to interpret the empirical results, then our estimated elasticities may not be directly interpreted as indicating the form of competition that has taken place in Egypt. Nevertheless, our results indicate what form of competition would be likely to result if public/private competition were promoted in the future.

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Appendix A

	MOH			Public			Private			Mosque		
	Yes	*No*	*DK/ Missing*	*Yes*	*No*	*DK/ Missing*	*Yes*	*No*	*DK/ Missing*	*Yes*	*No*	*DK/ Missing*
In general, are you satisfied with the quality of services?	75.05%	24.95%	0%	76.76%	23.24%	0%	91.57%	3.09%	5.33%	94.19%	5.81%	0%
Process												
Question 223. Did (any person) explain to you any of the following:												
a. Diagnosis	75.44%	24.56%	0%	77.34%	22.66%	0%	88.35%	11.65%	0%	83.72%	16.28%	0%
b. Treatment	72.30%	27.70%	0%	75.59%	24.41%	0%	86.83%	13.17%	0%	75.0%	25.0%	0%
c. Side-effect of treatment	15.91%	84.09%	0%	19.92%	80.08%	0%	31.07%	68.93%	0%	21.51%	78.49%	0%
Question 237. Was an information form filled for you when you entered for the first time?	15.13%	82.12%	2.75%	42.19%	54.88%	2.93%	22.98%	64.19%	12.83%	6.98%	90.12%	2.91%
Question 247. In your opinion, did the physician spend enough time with you?	70.73%	27.11%	2.16%	70.51%	27.73%	1.76%	91.31%	2.57%	6.12%	91.28%	6.98%	1.74%

	MOH					Public					Private					Mosque				
	EX	*VG*	*GD*	*SA*	*PR*	*EX*	*VG*	*GD*	*SA*	*PR*	*EX*	*VG*	*GD*	*SA*	*PR*	*EX*	*VG*	*GD*	*SA*	*PR*
Question 245. What is your opinion about the treatment of the patients by the staff? %	10.4	15.5	53.8	10.2	9.0	14.5	18.0	43.8	14.9	7.6	24.8	24.7	37.5	2.1	0.5	15.2	34.9	45.9	3.5	

EX=excellent VG=very good GD=Good SA=satisfactory PR=poor

Access	***MOH***			***Public***			***Private***			***Mosque***		
	Yes	***No***	***DK/Missing***	***Yes***	***No***	***DK/Missing***	***Yes***	***No***	***DK/Missing***	***Yes***	***No***	***DK/Missing***
Question 234. Are working days convenient for you?	49.12%	2.16%	48.72%	54.69%	3.71%	41.60%	52.14%	1.45%	46.41%	47.09%	1.74%	51.16%
Question 235. Are the working hours convenient for you?	91.36%	7.66%	0.98%	90.43%	8.20%	1.37%	91.24%	3.55%	5.20%	95.35%	4.07%	0.58%
Question 238. Did you need a prior appointment?	2.16%	96.86%	0.98%	9.38%	89.26%	1.37%	9.68%	79.79%	10.53%	6.98%	92.44%	0.58%
	Easy		***Difficult***	***Easy***		***Difficult***	***Easy***		***Difficult***	***Easy***		***Difficult***
Question 224. Was it easy or difficult for you to get to (name of place)?	88.80%		10.61%	84.18%		14.26%	100%		0%	97.09%		2.33%
	Average			***Average***			***Average***			***Average***		
Question 226. How long did it take from your home to (name of place)? (minutes)	29.33			37.80			32.04			19.91		
Question 239. How long did it take for an appointment? (minute)	21.09			6.10			5.31			2.25		
Question 245. How long did you waited to be examined? (minute)	44.14			59.27			39.04			49.88		

Structure	MOH			Public			Private			Mosque		
	Yes	No	DK/Missing	Yes	No	DK/Missing	Yes	No	DK/Missing	Yes	No	DK/Missing
Question 243. Was the medical examination conducted in a private room?	87.43%	11.59%	0.98%	92.19%	6.45%	1.37%	88.94%	0.53%	10.53%	97.67%	1.74%	0.58%
Question 244. In your opinion, do you think that the number of the staff is adequate to meet the clients' needs?	80.75%	11.39%	7.86%	81.84%	11.91%	6.25%	82.29%	4.41%	13.29%	91.86%	3.49%	4.65%
A. Was the examination room clean?	91.36%	6.29%	2.36%	90.82%	5.86%	3.32%	88.02%	0.92%	11.06%	95.35%	2.91%	1.74%
B. Was the waiting room clean?	85.85%	10.02%	3.12%	87.11%	8.01%	4.89%	87.23%	1.45%	11.31%	96.51%	1.74%	1.74%
C. Was the toilet clean?	55.80%	13.36%	30.84%	62.89%	10.74%	26.37%	68.14%	1.84%	30.02%	62.21%	2.33%	35.46%
D. Was the equipment clean?	85.85%	6.88%	7.39%	85.74%	4.10%	10.16%	86.18%	0.66%	13.16%	93.60%	1.74%	4.65%
E. Was the appearance of staff clean?	88.80%	7.27%	3.93%	87.70%	7.81%	4.49%	86.44%	0.99%	12.57%	97.67%	1.16%	1.16%
Question 241. Where did you wait until you were examined?												
A. Hall/Waiting Rm	65.62%			78.32%			80.32%			85.47%		
B. Passage btw Rm	8.45%			4.10%			0.79%			3.49%		
C. In Front of Examination Rm	16.11%			9.57%			2.57%			7.56%		
D. Outside	2.36%			1.17%			0.20%			0%		
E. Other	6.48%			5.47%			5.60%			2.91%		
Missing	0.98%			1.37%			10.53%			0.58%		

	MOH				Public				Private				Mosque			
	Seat	Stand	Other	Missing	Seat	Stand	Other	Missing	Seat	Stand	Other	Missing	Seat	Stand	Other	Missing
Question 242. Did you find a seat or did you stand until you were examined	76.62%	15.13%	7.27%	0.98%	82.42%	11.33%	4.88%	1.37%	82.42%	1.65%	5.40%	10.53%	92.44%	4.65%	2.33%	0.58%

Appendix B

(i)(principal factors; 2 factors retained)

Factor	*Eigenvalue*	*Difference*	*Proportion*	*Cumulative*
1	0.44631	0.37480	2.0513	2.0513
2	0.07151	0.07454	0.3287	2.3799
3	-0.00303	0.09234	-0.0139	2.3660
4	-0.09537	0.10647	-0.4383	1.9276
5	-0.20184	.	-0.9276	1.0000

(ii) Factor Loadings

Variable	*1*	*2*	*Uniqueness*
C220	0.40489	0.10359	0.82533
D220	0.44144	0.03672	0.80378
F220	0.11966	-0.01884	0.98533
G220	0.10279	-0.19690	0.95067
H220	-0.25023	0.14250	0.91708

C = good treatment
D = good reputation
F = prior experience
G = specialized staff
H = referred

Table 1b: Access (obs=4356)

(i) (principal factors; 3 factors retained)

Factor	*Eigenvalue*	*Difference*	*Proportion*	*Cumulative*
1	0.80407	0.37510	0.9429	0.9429
2	0.42897	0.12613	0.5030	1.4459
3	0.30284	0.33559	0.3551	1.8010
4	-0.03275	0.15770	-0.0384	1.7626
5	-0.19045	0.01061	-0.2233	1.5393
6	-0.20106	0.05777	-0.2358	1.3035
7	-0.25884	.	-0.3035	1.0000

(ii) Factor Loadings

Variable	*1*	*2*	*3*	*Uniqueness*
q235	0.26018	0.22177	0.29807	0.79428
q234	0.19815	0.21385	0.32385	0.81013
q238	0.53678	-0.24052	-0.02065	0.65359
q239	0.52823	-0.25288	-0.03428	0.65585
q240	0.17022	0.13710	-0.09376	0.94344
q224	0.25155	0.32443	-0.19180	0.79468
q226	0.19417	0.29700	-0.24887	0.81216

Table 1c: Process (obs=4462)

(i) (principal factors; 3 factors retained)

Factor	*Eigenvalue*	*Difference*	*Proportion*	*Cumulative*
1	1.12260	0.96858	1.3456	1.3456
2	0.15402	0.09358	0.1846	1.5302
3	0.06044	0.13826	0.0724	1.6026
4	-0.07781	0.11705	-0.0933	1.5094
5	-0.19487	0.03522	-0.2336	1.2758
6	-0.23009	-0.2758	.	1.0000
7	-0.25884	.	-0.3035	1.0000

(ii) Factor Loadings

Variable	*1*	*2*	*3*	*Uniqueness*
q245	0.40003	0.24114	0.03326	0.78072
q247	0.46428	0.20495	-0.05690	0.73921
q223a	0.54775	-0.11670	-0.09023	0.67821
q223b	0.54089	-0.18769	-0.00120	0.67221
q223c	0.37477	-0.07080	0.10862	0.84273
q237	0.11820	0.00304	0.19015	0.94986

Table 1d: Structure
(obs=4462)

(i) (principal factors; 3 factors retained)

Factor	*Eigenvalue*	*Difference*	*Proportion*	*Cumulative*
1	2.71285	1.92336	0.9295	0.9295
2	0.78949	0.72224	0.2705	1.2000
3	0.06724	0.06881	0.0230	1.2230
4	-0.00157	0.02650	-0.0005	1.2225
5	-0.02807	0.05488	-0.0096	1.2129
6	-0.08294	0.02888	-0.0284	1.1844
7	-0.11183	0.08062	-0.0383	1.1461
8	-0.19245	0.04159	-0.0659	1.0802
9	-0.23404	.	-0.0802	1.0000

(ii) Factor Loadings

Variable	*1*	*2*	*3*	*Uniqueness*
q241	0.30210	0.56217	-0.05826	0.58930
q242	0.36059	0.55193	-0.05284	0.56255
q243	0.23649	0.17231	0.15454	0.89050
q244	0.37364	0.09855	0.17152	0.82126
q246a	0.70039	-0.21883	-0.03936	0.46002
q246b	0.74000	-0.05091	-0.05970	0.44624
q246c	0.54626	0.03243	0.04775	0.69826
q246d	0.69462	-0.20456	-0.01089	0.47554
q246e	0.69064	-0.18983	-0.01556	0.48674

Table 2
Scoring Coefficients

Fac220		*Access*		*Process*		*Structure*	
Variable	***Coeff.***	***Variable***	***Coeff.***	***Variable***	***Coeff.***	***Variable***	***Coeff.***
C220	0.29609	q235	0.15018	q245	0.19622	q241	0.08773
D220	0.32883	q234	0.11391	q247	0.23488	q242	0.10811
F220	0.08126	q238	0.34305	q223a	0.29373	q243	0.05042
G220	0.07063	q239	0.33566	q223b	0.29189	q244	0.08135
H220	-0.17365	q240	0.08956	q223c	0.17352	q246a	0.22174
		q224	0.14664	q237	0.05205	q246b	0.25480
		q226	0.11233			q246c	0.12992
						q246d	0.22060
						q246e	0.21220